

Key

# Practice: Solving and Graphing Quadratic Equations (easier)

$$y = -x^2 + 2x + 1$$

Problem		1	2	3	4	5	6
Equation		$y = x^2 + 2x - 8$	$y = x^2 + x - 6$	<del><math>y = x^2 + 4x + 5</math></del>	$y = x^2 + 2x - 3$	$y = x^2 + 5x - 6$	$y = 4x^2 + 8x + 3$
a, b, c		$a = 1$ $b = 2$ $c = -8$	$a = 1$ $b = 1$ $c = -6$	$a = -1$ $b = 2$ $c = 1$	$a = 1$ $b = 2$ $c = -3$	$a = 1$ $b = 5$ $c = -6$	$a = 4$ $b = 8$ $c = 3$
Discriminant $b^2 - 4ac$		$2^2 - 4(1)(-8)$ $4 + 32$ $36$	$1^2 - 4(1)(-6)$ $1 + 24$ $25$	$4 - 4(-1)(1)$ $4 + 4$ $8$	$2^2 - 4(1)(-3)$ $4 + 12$ $16$	$25 - 4(1)(-6)$ $25 + 24$ $49$	$64 - 4(4)(3)$ $64 - 48$ $16$
#/Type of solutions		2 real	2 real	2 real	2 real	2 real	2 real
Open up or open down?		up $\uparrow\uparrow$	up $\uparrow\uparrow$	down $\downarrow\downarrow$	up $\uparrow\uparrow$	up $\uparrow\uparrow$	up $\uparrow\uparrow$
Vertex	Vertex - Max or Min?	min	min	max	min	min	min
	x-coordinate $-\frac{b}{2a}$	$\frac{-2}{2(1)} = \frac{-2}{2}$ $-1$	$\frac{-1}{2(1)} = \frac{-1}{2}$ $-\frac{1}{2}$	$\frac{-2}{2(-1)} = \frac{-2}{-2}$ $1$	$\frac{-2}{2(1)} = -1$	$\frac{-5}{2}$	$\frac{-8}{2(4)} = -1$
	y-coordinate	$(-1)^2 + 2(-1) - 8$ $1 - 2 - 8$ $-9$	$y = (-\frac{1}{2})^2 - \frac{1}{2} - 6$ $y = \frac{1}{4} - \frac{1}{2} - 6$ $y = -6\frac{1}{4}$	$-(-1)^2 + 2(-1) + 1$ $-1 - 2 + 1$ $-2$	$y = (-1)^2 + 2(-1) - 3$ $y = 1 - 2 - 3$ $y = -4$	$y = (-\frac{5}{2})^2 + 5(\frac{-5}{2}) - 6$ $y = -12.25$	$y = 4(-1)^2 + 8(-1) + 3$ $y = 4 - 8 + 3$ $y = -1$
	ordered pair	$(-1, -9)$	$(-\frac{1}{2}, -6\frac{1}{4})$	$(1, -2)$	$(-1, -4)$	$(-\frac{5}{2}, -12\frac{1}{4})$	$(-1, -1)$
y-intercept $(0, c)$		$(0, -8)$	$(0, -6)$	$(0, 1)$	$(0, -3)$	$(0, -6)$	$(0, 3)$
Symmetric point to y intercept		$(-2, -8)$	$(-1, -6)$	$(2, 1)$	$(-2, -3)$	$(-5, -6)$	$(-2, 3)$
Method to solve?		factor	factor	Q formula	factor	Q formula	Q formula
x-intercepts		$0 = (x+4)(x-2)$ $x = -4, 2$	$0 = (x+3)(x-2)$ $x = -3, 2$	$\frac{-2 \pm \sqrt{8}}{-2}$ $-2$	$0 = (x+3)(x-1)$ $x = -3, 1$	$\frac{-5 \pm \sqrt{49}}{2}$ $\frac{-5 \pm 7}{2}$	$\frac{-8 \pm \sqrt{16}}{2(4)}$ $\frac{-8 \pm 4}{8}$

$$(-4, 0)$$
  
 $(2, 0)$

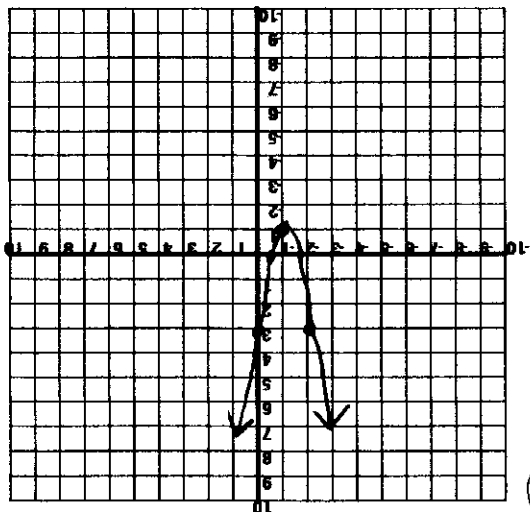
$$(-3, 0)$$
  
 $(2, 0)$

$$x = -0.4$$
  
 $x = 2.4$

$$(-3, 0)$$
  
 $(1, 0)$

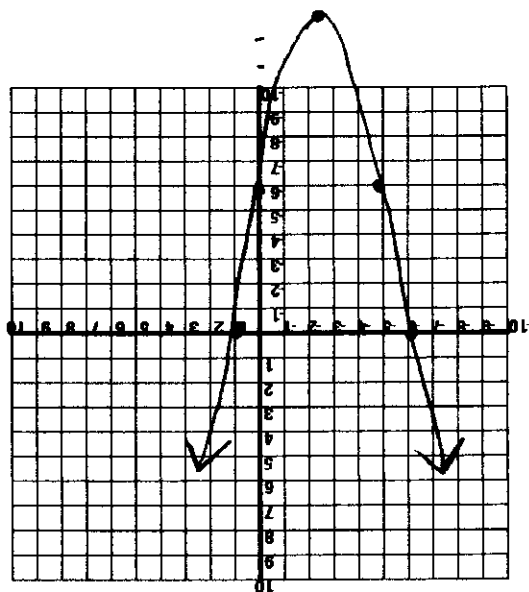
$$x = 1, -6$$

$$x = -\frac{1}{2}, -\frac{3}{2}$$



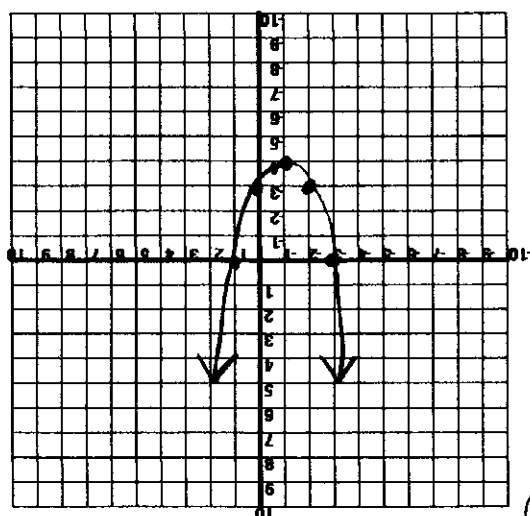
$$y = -4x^2 + 8x + 3$$

⑥



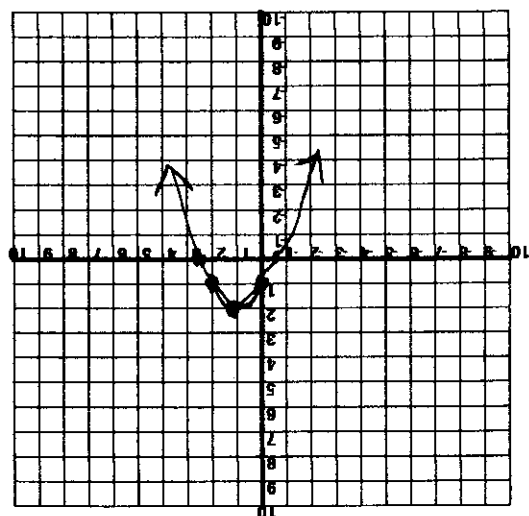
$$y = x^2 + 5x - 6$$

⑤



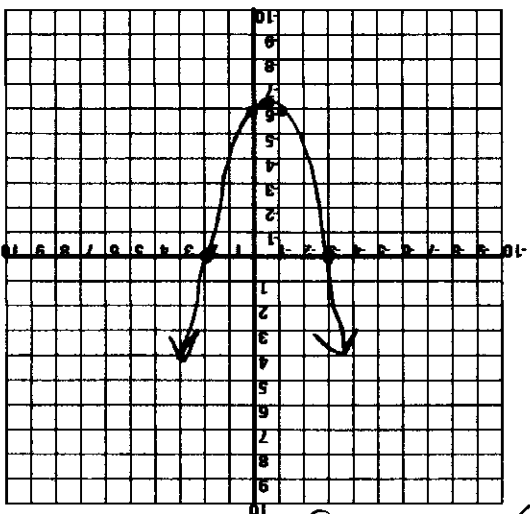
$$y = x^2 + 2x - 3$$

④



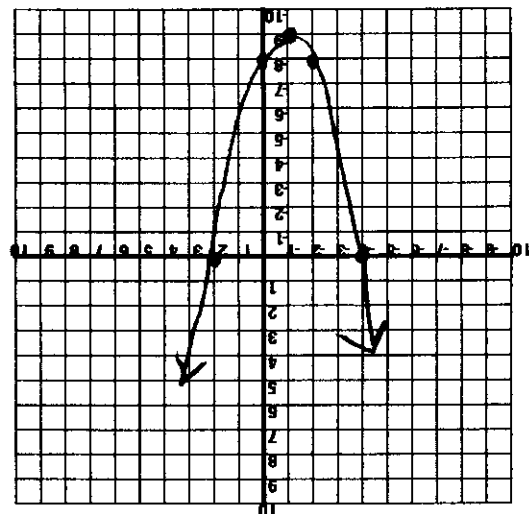
$$y = -x^2 + 2x + 1$$

③



$$y = x^2 + x - 6$$

②



$$y = x^2 + 2x - 8$$







①

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Key

# Practice: Solving and Graphing Quadratic Equations (harder)

$$y = -x^2 + 4x - 6$$

Problem		1	2	3	4	5	6
Equation		$y = -x^2 + 5x - 4$	<del><math>y = -2x^2 + 16x + 39</math></del>	$y = x^2 - 2x + 1$	$y = -x^2 + 2x - 2$	$y = x^2 + x - 3$	$y = -x^2 + 4x - 4$
a, b, c		$a = -1$ $b = 5$ $c = -4$	$a = -1$ $b = 4$ $c = -6$	$a = 1$ $b = -2$ $c = 1$	$a = -1$ $b = 2$ $c = -2$	$a = 1$ $b = 1$ $c = -3$	$a = -1$ $b = 4$ $c = -4$
Discriminant $b^2 - 4ac$		$5^2 - 4(-1)(-4)$ $25 - 16 = 9$	$4^2 - 4(-1)(-6)$ $16 - 24$ $(-8)$	$(-2)^2 - 4(1)(1)$ $4 - 4$ $(0)$	$2^2 - 4(-1)(-2)$ $4 - 8 = (-4)$	$1^2 - 4(1)(-3)$ $1 + 12$ $(13)$	$4^2 - 4(-1)(-4)$ $16 - 16$ $(0)$
#/Type of solutions		2 real	0 real	1 real	0 real	2 real	1 real
Open up or open down?		down 	down 	up 	down 	up 	down 
Vertex	Vertex - Max or Min?	max	max	min	max	min	max
	x-coordinate	$\frac{-5}{2(-1)} = \frac{-5}{-2}$ $= \frac{5}{2}$	$\frac{-4}{2(-1)} = \frac{-4}{-2}$ $= 2$	$\frac{2}{2} = 1$	$\frac{-2}{2(-1)} = \frac{-2}{-2}$ $= 1$	$\frac{-1}{2(1)} = -\frac{1}{2}$	$\frac{-4}{2(-1)} = \frac{-4}{-2}$ $= 2$
	y-coordinate	$y = -(\frac{5}{2})^2 + 5(\frac{5}{2}) - 4$ $y = \frac{-25}{4} + \frac{25}{2} - 4$ $y = 2.25$	$y = -(2)^2 + 4(2) - 6$ $-4 + 8 - 6$ $-2$	$y = 1^2 - 2(1) + 1$ $y = 1 - 2 + 1$ $y = 0$	$y = -(1)^2 + 2(1) - 2$ $y = -1 + 2 - 2$ $y = -1$	$y = (-\frac{1}{2})^2 - \frac{1}{2} - 3$ $y = -3.25$	$y = -(2)^2 + 4(2) - 4$ $y = -4 + 8 - 4$ $y = 0$
	ordered pair	$(\frac{5}{2}, 2\frac{1}{4})$	$(2, -2)$	$(1, 0)$	$(1, -1)$	$(-\frac{1}{2}, -3\frac{1}{4})$	$(2, 0)$
y-intercept		$(0, -4)$	$(0, -6)$	$(0, 1)$	$(0, -2)$	$(0, -3)$	$(0, -4)$
Symmetric point to y intercept		$(5, -4)$	$(4, -6)$	$(2, 1)$	$(2, -2)$	$(-1, -3)$	$(4, -4)$
Method to solve?		factor	X	factor	X	Q formula	factor
x-intercepts		$0 = -x^2 + 5x - 4$ $0 = x^2 - 5x + 4$ $0 = (x-4)(x-1)$	X	$0 = (x-1)(x-1)$ $x = 1$	X	$\frac{-1 \pm \sqrt{13}}{2}$	$0 = -x^2 + 4x - 4$ $0 = x^2 - 4x + 4$ $0 = (x-2)(x-2)$

$$x = 4, 1$$

only 3 pts to graph

only 3 pts to graph

only 3 pts to graph

$$x = \frac{-1 \pm \sqrt{13}}{2} = 1.3$$

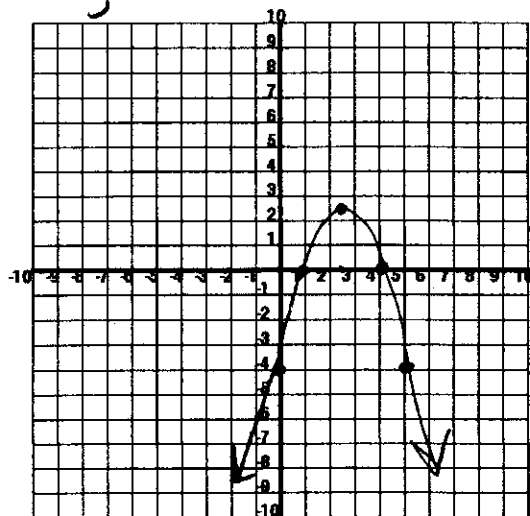
$$x = \frac{-1 \pm \sqrt{13}}{2} = -2.3$$

$x = 2$   
only 3 pts to graph

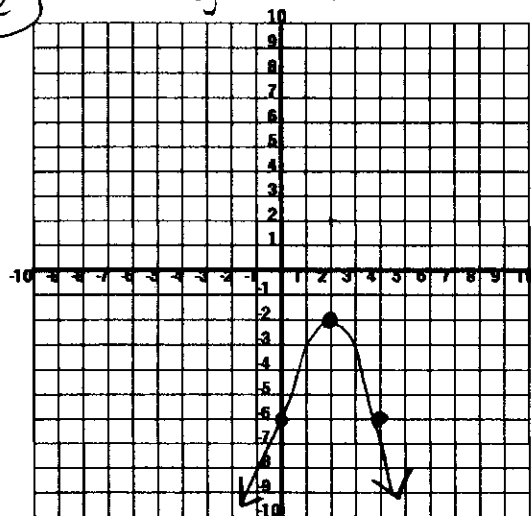
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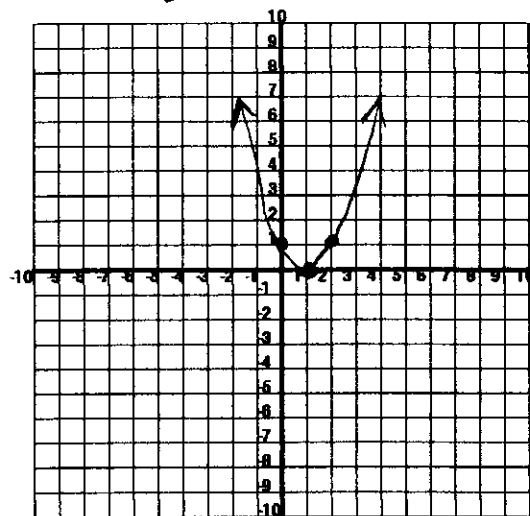
(1)  $y = -x^2 + 5x - 4$



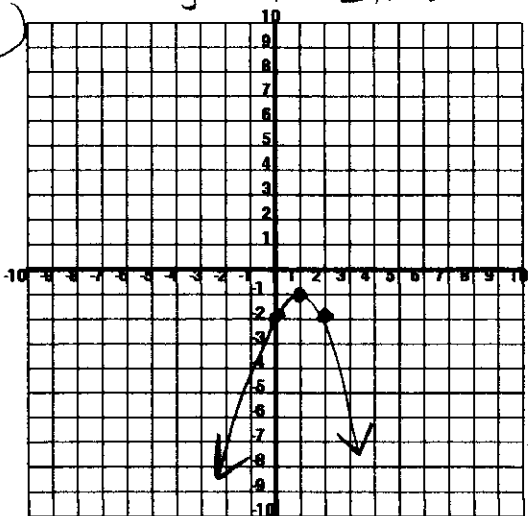
(2)  $y = -x^2 + 4x - 6$



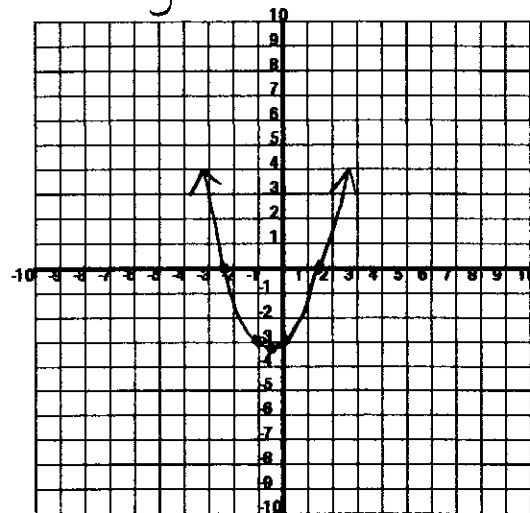
(3)  $y = x^2 - 2x + 1$



(4)  $y = -x^2 + 2x - 2$



(5)  $y = x^2 + x - 3$



(6)  $y = -x^2 + 4x - 4$

